

Oriental species of the genus *Biroina* Richards (Diptera: Sphaeroceridae)

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Oriental species of the genus *Biroina* Richards (Diptera: Sphaeroceridae). - *Biroina burckhardti* sp. n. (Thailand), *B. orientalis* sp. n. (Pakistan, India, Nepal) and *B. topali* sp. n. (India) are described. The genus *Biroina* is reported from the Oriental Region for the first time. Synapomorphies (especially those of the male genitalia) for the species are summarized and the new species are compared with the type-species *B. myrmecophila* (Knab & Malloch, 1912).

Key-words: Diptera - Sphaeroceridae - *Biroina* - Taxonomy - Oriental region.

INTRODUCTION

DUDA (1925) described *Biroella* as a monotypic subgenus of *Leptocera* based on *Limosina myrmecophila* Knab & Malloch, from New South Wales. That name is homonymous, so RICHARDS (1973) gave a new name for *Biroella* Duda, and described 13 new species from Australia and one from New Zealand. MARSHALL (1989) elevated its rank to genus and listed all the 15 species, although the generic attribution of some of them is questionable (Marshall, pers. comm.). The species presently placed in *Biroina* would need a revision. In the course of our studies on sphaerocerid flies, three species of *Biroina* were found also in the Oriental Region (see ROHÁČEK & PAPP 1988). Below these three species are described with a re-description of the type-species, *B. myrmecophila*. It is hoped that the present paper could be regarded as a preparatory step for a revision of the genus *Biroina*.

The morphological terminology of ROHÁČEK & PAPP (1988) is followed here.

The types and other material are deposited in two museums: MHNG — Muséum d'histoire naturelle Genève (Switzerland); HNHM — Hungarian Natural History Museum, Budapest (Hungary).

TAXONOMY

Biroina Richards, 1973

Biroella DUDA, 1925: 74; type-species: *Limosina myrmecophila* Knab & Malloch, 1912 (by monotypy).

Biroina RICHARDS, 1973: 330, new name for *Biroella* Duda, 1925, a junior homonym of *Biroella* Bolivar, 1903, as a subgenus of *Leptocera* Olivier, 1813. Type-species: *Limosina myrmecophila* Knab & Malloch, 1912.

Biroina Richards: MARSHALL, 1989: 602, as genus.

Based on the findings published below, the genus *Biroina* is defined as follows (possible synapomorphies are indicated by an asterisk, characteristics as given by ROHÁČEK (1982) and ROHÁČEK & PAPP (1988): (1) *pvt* small or indistinct but *occe* and *occi* rather long; (2) 2 *ors*; (3) (3)-4-5 *ifr*; (4) frons with or without dark M-shaped mark; (5) 1-2 *dc*, if 2, anterior always short; (6) 8-12 tows of *ac* microsetae; (7) 1 katapisternal; (8) scutellum flat, semicircular or even broader; (9) male fore and hind femora not much thickened; (10)* t_2 chaetotaxy (dorsal side) characterized by 2 pairs of proximal bristles (though upper proximal *ad* more proximal than its *pd* pair in some species) and 3 very long distal bristles; ventral side without mid ventral seta; (11) wing with *C* not extending beyond apex of R_{4+5} ; (12) R_{2+3} strongly sinuate; (13) discal cell short and broad, usually with extensions of M_{1+2} and M_{3+4} , one of them or both approximate wing margin in some species; (14) alula small and narrow; (15) preabdomen with large, heavily sclerotized terga, preabdominal sternites rather large and well sclerotized; (16) male sternite 5 without additional structures; (17) posteromedial part of sternite 5 less sclerotized with short setae; (18) epandrium (periandrium) mostly semiglobular; (19)* hypandrium without robust bifurcate ventral appendage but with a slipper-shaped cranioventral process, its ventral surface with or without small teeth; (19)* hypandrium with a caudally directed apodeme (Figs 20, 29, cf. Fig. 61 of ROHÁČEK & PAPP 1988, Fig. 32 of PAPP 1991); (20) male subanal plate distinct; (20a)* epandrium lateroventrally usually with a pair of lamelliform processes (Figs 22, 26), which are not fused with subanal plate, i.e. its derivation from subanal plate is questionable; (21) surstylus (gonostylus) bilobed, lateral lobe with numerous long to extremely long setae, medial lobe various; (22)* phalophore long digitiform or very long; (23) distiphallus complex with dorsal appendages; (24) postgonite of various shape but always simple; (25) ejaculatory apodeme well developed; (26)* female postabdomen fully telescoped and hidden in segment 5 when at rest; (27) female *T6* and *T7* divided into two, also *S6* and *S7* weakly sclerotized though they may be broad (e.g. in *orientalis*); (28)* female tergite 8 divided into 4 long narrow sclerites; (29) tergite 10 very short; (30) female sternite 8 narrow and weakly sclerotized; (31) sternite 10 small; (32) spectacles-shaped sclerites weakly sclerotized; (33) accessory glands not studied now; (34) spermathecae pear-shaped or spherical; (35) female cerci with or without sinuate hairs.

ROHÁČEK's (1982, 1983) revision of the limosinine genera, though its was not aimed at a complete revision of the World fauna, gave enough basis also for those genera not considered there to have them judged for their generic identity. Based on

the synapomorphies hitherto considered, I think, *Biroina* deserves a generic rank indeed.

Remark. The genus *Apterobiroina* L. Papp, 1979 is not related to the genus *Biroina* as originally stated by PAPP (1979) but possibly to *Minilimosina* Roháček, 1983 (this will be discussed in a future paper).

***Biroina burckhardti* sp. n.**

Holotype ♂ (MHNG): Thaïlande, Chang Mai, Doi Suthep, 1400 m, 5.XI.1985, D. Burckhardt - I. Löbl (No. 11).

Measurements in mm: body length 2.79, wing length 2.05, wing width 0.90.

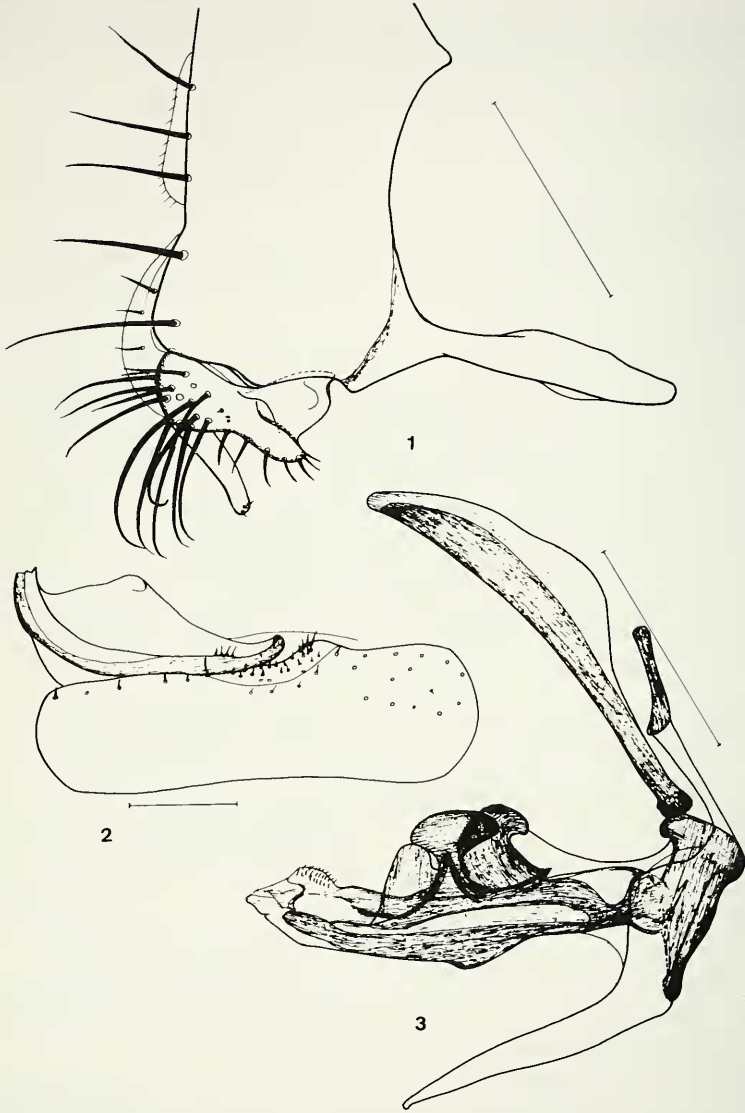
Body dark greyish brown, mesonotum subshining, pleura with thick grey microtomentum.

Frons light brown, face, genae and occiput light reddish brown. M-shaped mark, including orbits (fronto-orbital plates), interfrontalia, ocellar triangle and the sagittal line of frontal vitta silvery. Frontal lunule small, triangular, gena below eye at narrowest 0.175 mm and strongly widening posteriorad. Cephalic chaetotaxy: *pvt* minute and divergent; 2 *ors* but anterior one reduced to a short thin hair (1/4 length of posterior *ors*); ocellars large; 4 pairs of short and thin *ifr*. Eyes mangoe-shaped. Antennae large, antennal length 0.29 mm, pedicel reddish brown, flagellomere conical, light dirty red. Arista 0.725 mm with short cilia.

Thoracic chaetotaxy: 1 *h*, 2 superposed *np*, 2 very long *sa*, 1 *pa*. Two *dc* pairs but anterior one less than half length of the posterior one. Femora light, reddish, apices brown, tibiae dark brown, basitarsus and 2nd tarsomere of fore tarsi brown, tarsomeres 3-5 white; mid and hind tarsomeres dirty yellow. *t*₂ chaetotaxy: two short anterals at 23/38 and 28/38; *ad-s*: very short at 7/38, short at 9/38, long at 15/38, very long at 31/38 of tibia; *pd-s*: medium long at 9/38, long at 18/38, very long at 30/38 of tibia. Wings light brown, veins dark brown. *R*₁ extremely short and thick, upcurving to costa at the level of the tip of alula, *R*₄₊₅ upcurving to costa on a wide arc, *R*₂₊₃ very short and sinuate, approximates costa at its middle, distance in its apical third to *C* is little more than the diameter of *C*. *mg*₂/*mg*₃ 0.34 mm to 0.775 mm (wing curved, i.e. not precisely measurable). *M*₁₊₂ and *M*₃₊₄ short, dark brown, former one parallel to *R*₄₊₅. *t*_a-*t*_p 0.207 mm, *t*_p 0.138 mm (i.e. ratio 1.50). Halteres waxy white.

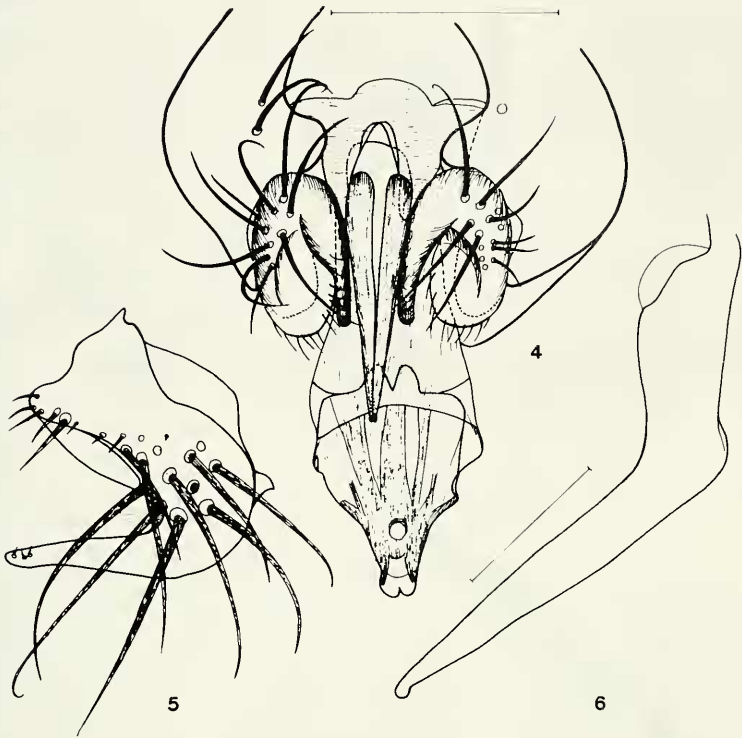
Preabdomen dull black, tergites with medium long and not thick discal and marginal bristles. Syntergite 1+2 nearly as long as tergite 3 and 4 combined. Male sternite 5 short, posteromedially with acute short setae (Fig. 2).

Genitalia: perianthium rather high (Fig. 1), slightly asymmetrical. Subanal plate is an intricate structure: its main part is a pair of wide caudal plates (Fig. 4) enlarged ventrally to the base of medial lobe of surstylus. Medial lobe of surstylus (Figs 4, 5) long, digitiform with minute setae only, lateral lobe with several extremely long setae. Aedeagal complex with comparatively short digitiform phallosophore (Fig. 3). Postgonite (Figs 3, 6) geniculate, its basal part much shorter than its apical part. Ejaculatory apodeme distinct though small. Hypandrium strongly asymmetrical, its medial anterior part wide and well sclerotized.



FIGS 1-3

Terminalia of *Biroina burckhardtii* sp. n., holotype male; 1. epandrium, hypandrium, cercus and surstylus laterally, 2. sternite 5 and 6, 3. aedeagal complex laterally. Scale bars: 0.2 mm.



FIGS 4-6

Terminalia of *Biroina burckhardti* sp. n., holotype male; 4. genitalia in subventral (subcaudal) view, 5. surstylus laterally, 6. postgonite laterally. Scale bars: 0.1 mm, 0.2 mm (Fig. 4).

Female unknown.

Biroina burckhardti sp. n. may be readily distinguished from the other Oriental species of the genus (see key); it is not closely related to the other two species.

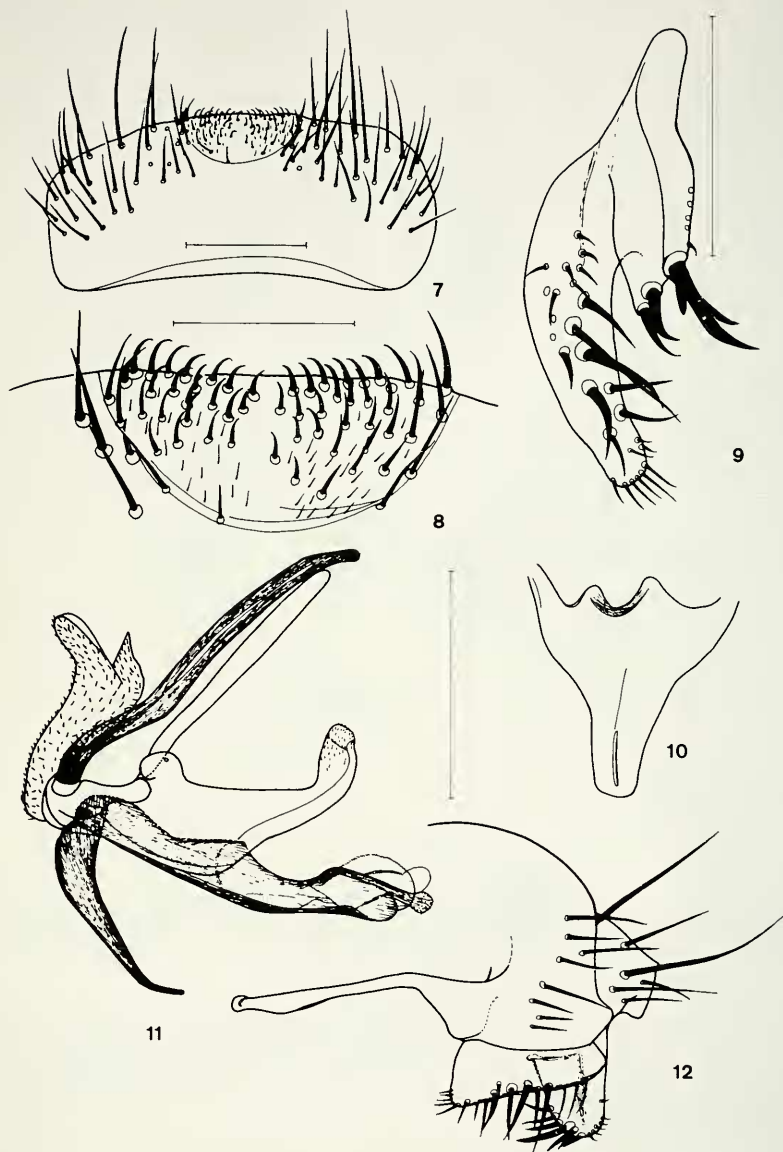
Etymology. This species is dedicated to Dr. Daniel Burckhardt (MHNG), one of the collectors of the holotype.

***Biroina myrmecophila* (Knab & Malloch)**

Limosina myrmecophila KNAB & MALLOCH, 1912: 236.

Material studied: 1 ♂ 5 ♀ (HNHM): Australia Biró 1900. — N.S. Wales, Mt. Victoria (on the reverse side: "XI/12/") — "*Biroella* ♂ ♀: *myrmecophila*" Det. Dr. O. Duda.

Measurements in mm: body length 2.50–3.30, wing length 2.17–2.71, wing width 1.09–1.31.



FIGS 7-12

Male terminalia of *Biroina myrmecophila* (Knab & Malloch); 7. male sternite 5, 8. postero-medial part of sternite 5 in higher magnification, 9. surstylus in ventral view, 10. main (medial) part of hypandrium, 11. aedeagal complex with a part of the subanal plate, 12. epandrium, cercus and surstylus laterally. Scale bars: 0.1 mm (Figs 8, 9), 0.2 mm (Figs 7, 10-12).

Body dark brown subshining.

Frons, face and genae reddish brown, frons without M-shaped mark. Frontal lunule subtriangular, gena as broad as width of eye, with very strong genal bristle below eye. Cephalic chaetotaxy: *pvt* minute but *occe* and *occi* very long; 1 short anterior and 3 very long pairs of *ifr*. Eyes small. Antennae reddish yellow, pedicel with extremely long bristles, flagellomere fuscous apically. Arista somewhat longer than width of head with very short cilia.

Thorax: mesonotum not granulated but very thinly microtomentose. Two *dc*, anterior one much shorter. Legs dark brown, tarsomeres somewhat lighter. *t₂* chaetotaxy: *ad-s*: short at 12/49, long at 19/49, very long at 40/49; *pd-s*: short at 12/49, long at 19/49, very long at 40/49, a very long and thick anteral at 37/49. Wings tessellate with darker diffuse dark spots on lighter basic colour, veins light brown. Proximal section of *C* with very long setae. *R₂₊₃* much sinuate (strongly S-shaped, see Fig. 28 of RICHARDS 1973). *R₄₊₅* slightly upcurving. *M₁₊₂* and *M₃₊₄* distinct, former one approximates wing margin. ta-tp as long as or even shorter than hind crossvein. Halteres brown.

Male preabdomen with broad and subshining terga, which bear medium long marginal and lateral setae, also sterna broad. Male sternite 5 posteromedially with rather long inclinate acute bristles (Figs 7, 8).

Male genitalia: Epandrium (periandrium) not high (Fig. 12). Subanal plate heavily sclerotized. Male cerci well-sclerotized with long setae (Fig. 12). Surstylus (gonostylus) with long lateral lobe which bears several long setae (Figs 9, 12), medial lobe very large and wide with numerous medium long but thick setae. Aedeagal complex with phallosophore (Fig. 11) very long, proclinate and very thin apically. Postgonite (Fig. 11) rather broad in its basal half, tapering distally, apical part geniculately bent, apex blunt. Ejaculatory apodeme small but distinct.

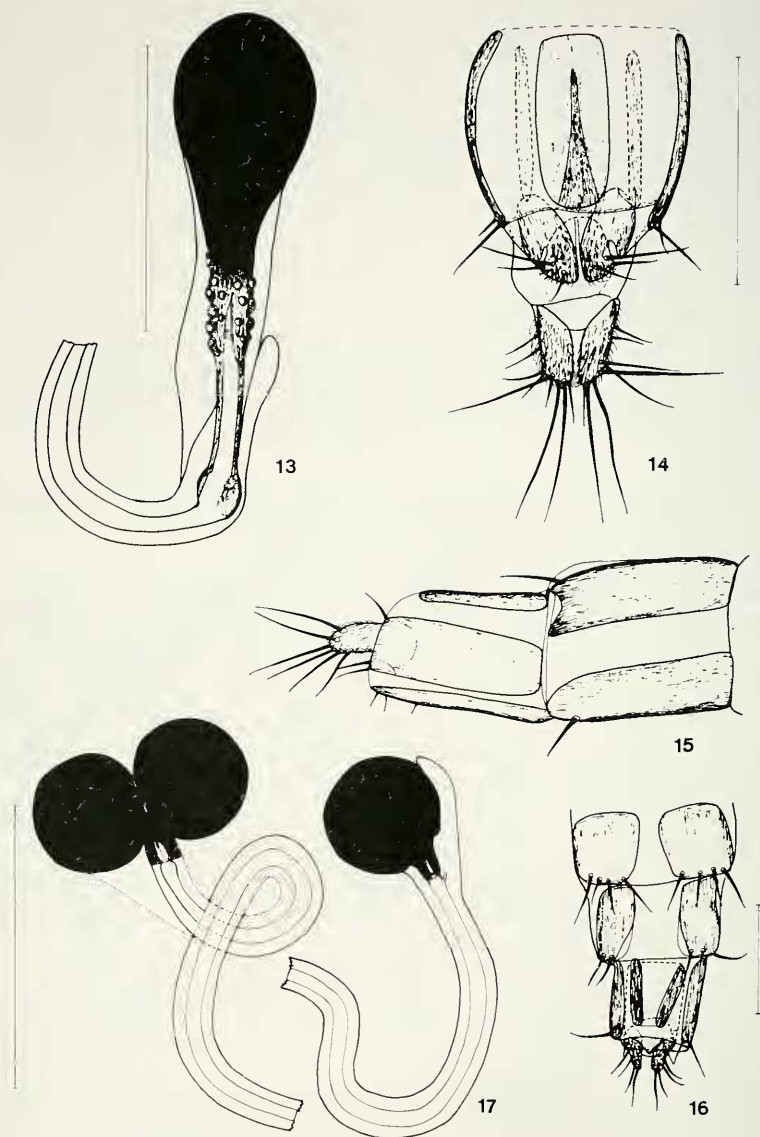
Female preabdomen as in male; postabdomen strongly telescoped. Tergite 8 in 4 parts (Fig. 14), sternite 8 long quadratic, sternite 10 in two parts. Cerci comparatively large (broad) with 3 pairs of very long and several shorter setae. Spermathecae (Fig. 13) pear-shaped, their sclerotized duct long, basally with small round mamillae; sclerotized duct distally with a small swelling.

Biroina myrmecophila (Knab & Malloch, 1912), the type-species of the genus, is markedly different from the three Oriental species (see key below). However, the generic characteristics (synapomorphies) listed above may serve as criteria for relegation to this genus when studying other species known as *Biroina*. RICHARDS (1973) although he did not see the holotype, depicted the same species as I do (cf. his Figs 40, 41); our specimens are from a site not far from the type-locality.

***Biroina orientalis* sp. n.**

Holotype ♂ (MHNG): India, Uttar Pradesh, Kumaon, Chaubattia, 12–13.X.1979, I. Löbl (No. 10).

Paratypes: 4 ♂, 3 ♀ (MHNG, HNHM): same data as for the holotype; 5 ♂, 4 ♀ (MHNG, HNHM, 1 ♂ damaged, left wing lost): *ibid.*, Ramgarh, 2000 m, O. Löbl, 9.X.1979 (No. 6/b.); 1 ♀ (MHNG): India, Uttar Pradesh, Gharwal, Dhanolti, I. Löbl (No. 19); 1 ♂, 1 ♀ (HNHM): India,



FIGS 13-17

Female terminalia of *Biroina* spp. 13-14. *B. myrmecophila* (Knab & Malloch); 13. spermatheca, 14. postabdomen in ventral view. 15-17. *B. orientalis* sp. n., paratype female; 15. postabdomen in lateral view, 16. same, dorsal view, 17. spermathecae. Scale bars: 0.1 mm (Figs 13, 17), 0.2 mm (Figs 14-15, 16).

Uttar Pradesh, Nainital, Sleepy Hollow, ca. 2080 m — sifted and singled from under stones. 4.XII.1989, leg. L. Papp; 1 ♂ (MHNG); Pakistan, Swat, Miandam, C. Besuchet-I. Löbl, 17.V.1983 (No. 15/b.): 1 ♂ (MHNG); *ibid.*, 10.V.1983 (No. 6c.): 1 ♂, 2 ♀ (MHNG); Népal, Bagmati, Malemchi, 2800 m, 14.IV.81, I. Löbl-A. Smetana (No. 24); 1 ♀ (MHNG); Népal, Prov. Bagmati, Tarke Ghyang, 2750 m, 19.IV.81, I. Löbl (No. 32a.); 1 ♀ (MHNG); Népal: Kosi, Induwa Kola, 2100 m, 17.IV.81, I. Löbl-A. Smetana (No. 27); 1 ♂, 2 ♀ (MHNG, 1 ♀ damaged, left wing lost); Népal, Bagmati, Gul Bhanjyang, 2600 m, 6.IV.81, I. Löbl-A. Smetana (No. 9).

Measurements in mm: body length 2.21 (holotype); 1.67–2.58 (paratypes), wing length 1.85 (holotype), 1.50–1.96 (paratypes), wing width 0.88 (holotype), 0.71–0.96 (paratypes).

Body dark brown, mesonotum dull, abdomen subshining dorsally.

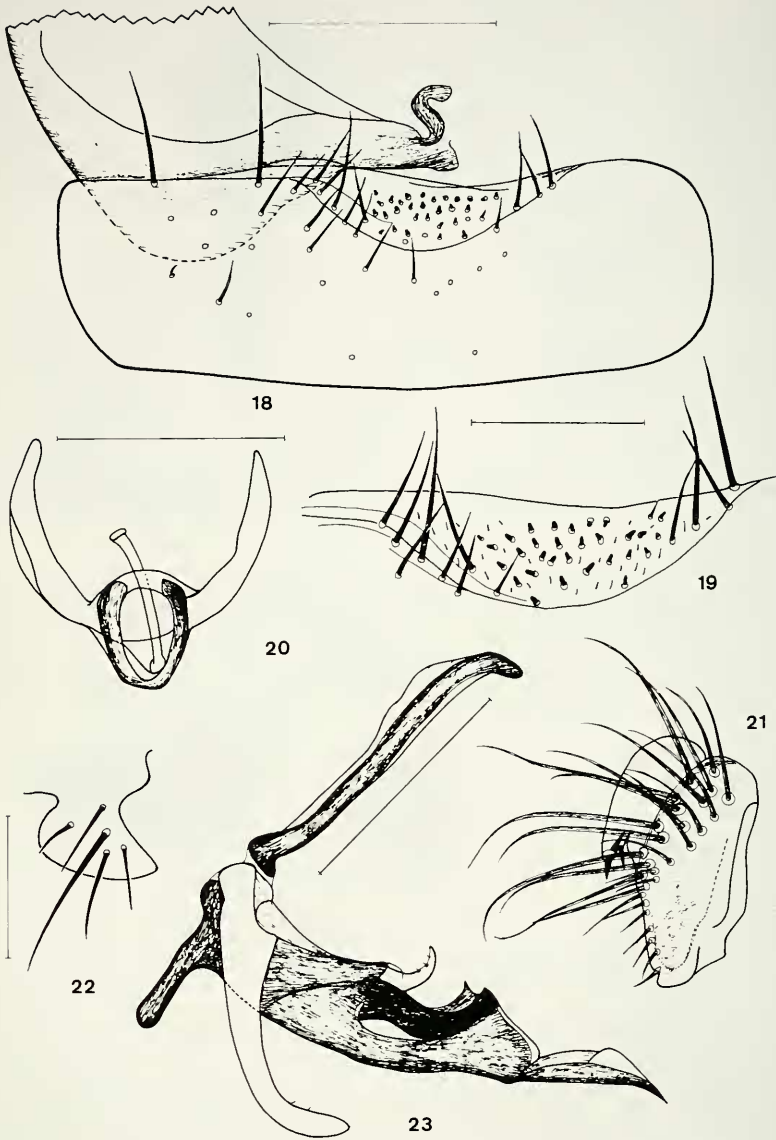
Frons dark reddish brown, orbitalia, vertex, interfrontal stripes and a sagittal line silvery microtomentose, so M-shaped mark well discernible. Frontal lunule subtriangular, light brown, gena bare in its dorsal two-thirds, face shining. Cephalic chaetotaxy: *pvt* small, *occe* and *occi* pairs comparatively long though thin; 2 *ors* close to each other; four pairs of *ifr* bristles; genal bristle less strong than in *myrmecophila*. Eyes not much reduced, gena below eye less broad than width of eye. Antennae long, reddish yellow, pedicel comparatively very long with very long bristles subapically, flagellomere long and pointed dorsoapically. Arista longer than width of head with medium long cilia.

Thorax dark brown with thick grey micromentum on mesonotum. Two *dc*, anterior one only half as long as posterior; 1 strong katapisternal. Legs dark brown but fore tarsomeres 2–5 whitish yellow, mid and hind tarsomeres 2–5 yellow. *t*₂ chaetotaxy: *ad-s*: short at 1/3, longer at 14/33, strong at 16/33, strong at 29/33 of tibia; *av-s*: short at 7/33, long at 17/33, very strong at 26/33 of tibia. Wings light brown without tessellate pattern, veins brown but not dark. *R*₂₊₃ strongly S-curved but runs close to costal vein in its whole length, *R*₄₊₅ upcurving to *C* along a wide arc. *M*₁₊₂ and *M*₃₊₄ rather short, not approximating wing margin. ta-tp as long as hind crossvein. Knob of halteres long and brown, stalk waxy yellow.

Male preabdomen dull black, tergites with medium long and not thick discal and marginal bristles. Sternite 1 reduced to a pair of minute round sclerites. Male sternite 5 posteromedially with blunt and somewhat flattened short setae (Fig. 19).

Male genitalia: perianthium only a little higher than long. Subanal plate similar to that of *topali* but lateroventral process of epandrium (Fig. 22) with less broad base. Ventral surface of slipper-shaped ventral process of hypandrium without small teeth (Fig. 20). Surstylus (gonostylus) with lateral lobe with numerous very long setae on its lateral surface but no long bristles in its cranial (apical) 2/5, medial lobe of surstylus (Fig. 21) lobate, with longer setae. Aedeagal complex with long digitiform phallosophore. Postgonite (Fig. 23) curved in distal third, its basal part much longer than its apical part. Ejaculatory apodeme bacilliform.

Female preabdomen similar to that of male; postabdomen fully telescoped. Tergites 6 and 7 divided into two, tergite 8 into four (Figs 15, 16), but sternite 6 to 8 not divided; tergite and sternite 10 minute, partly hidden under tergite and sternite 8 (Fig. 15). Cerci short and pale yellow with comparatively short setae. Spermathecae spherical, their sclerotized duct short (Fig. 17).



FIGS 18-23

Terminalia of *Biroina orientalis* sp. n., paratype male; 18. sternite 5 with a part of sternite 6, 19. posteroventral part of sternite 5 in a higher magnification, 20. hypandrium in ventral view, 21. surstylus in its widest extension, 22. subanal process in its widest, 23. aedeagal complex laterally. Scale bars: 0.1 mm (Figs 19, 22), 0.2 mm (Figs 18, 20, 21, 23).

Biroina orientalis sp. n. is closely related to *B. topali* sp. n.; differentiating characteristics are given in the key.

Etymology. Derived from its distribution.

***Biroina topali* sp. n.**

Holotype ♂ (HNHM): India, No. 925, Daitari, Orissa, 600-700 m — erdei avarból [from forest litter], 1967.XI.23, leg. [György] Topál.

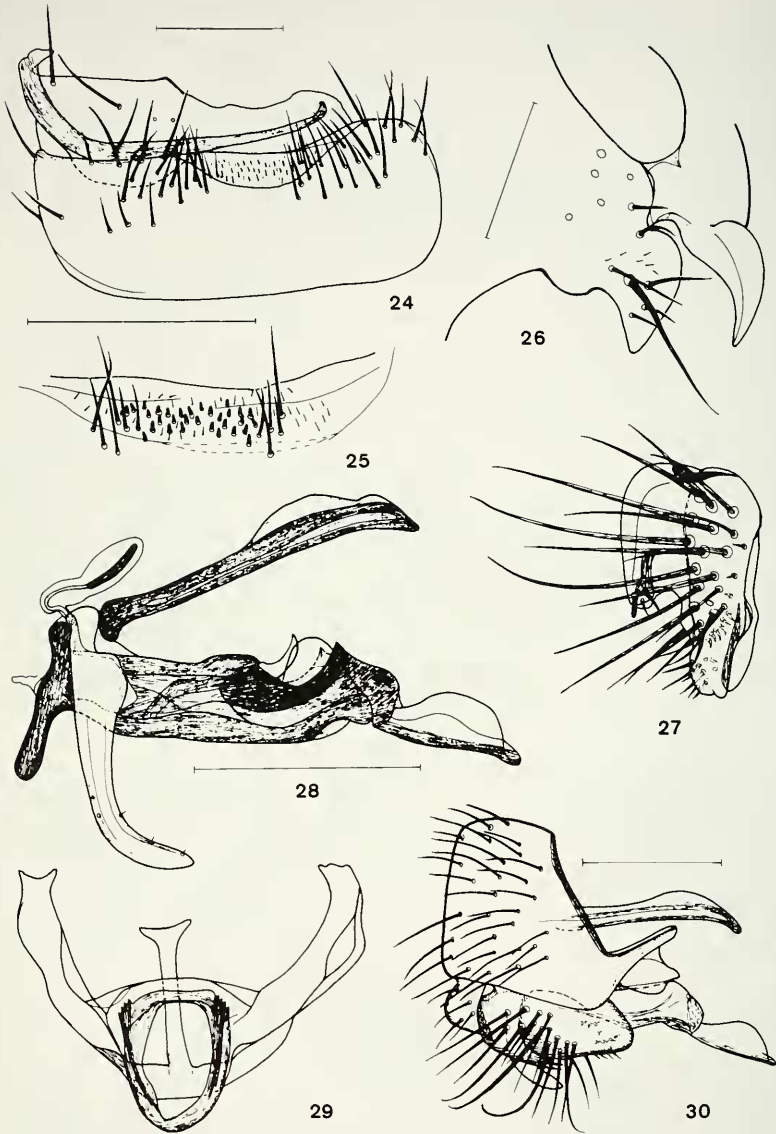
Measurements in mm: body length 2.96, wing length 2.18, wing width 1.05.

Body mainly dark brown, thinly microtomentose, i.e. not shining.

Frons rather flat and as head, very broad, though somewhat longer than wide. M-shaped mark distinct, ocellar triangle, vertex and occiput dark brown, orbits dark only to the base of *ors*, anterior parts of orbits, interfrontal and sagittal stripes yellowish silvery dusted, other parts of frons light brownish yellow. Frontal lunule triangular. Gena reddish yellow with honey shine, only peristomal area dusted with silvery microtomentum, gena at genal bristle 0.216 mm wide and strongly widening posteriorad. Face bright ochreous. Cephalic chaetotaxy: *pvt* minute, *occe* and *occi* rather long; 2 *ors* close to each other; 5 *ifr* comparatively long but thin, genal bristle long, ca. 3/5 of vibrissa in length, *vte*, *vti* and *oc* strong (occellars lost but must be strong judged by their bases). Eyes long elliptical, longitudinal axis rather oblique, length/width 0.40/0.26 mm. Antennae light, reddish yellow, only scape brown, the latter with a long ventrally directed thick hair, pedicel with 6 very long and thick setae, flagellomere conical with long silvery cilia. Arista medium long with long hairs.

Thorax: mesonotum flat with numerous (up to 12) rows of small hairs. Two *dc* pairs but anterior pair less than half length of posterior one; only 1 katepisternal (anterior pair reduced to a small hair, which is less than 1/3 in length of the posterior one). Scutellum flat and very broad, nearly semicircular, 0.33 mm long, 0.585 mm wide (scutellars broken off). Legs brown, 3rd to 5th tarsomeres of fore tarsi white (yellowish white), mid and hind tarsi yellow. t_2 chaetotaxy: anterodorsals: two small ones at 7/39 and 9/39, one strong at middle, small at 30/39, one very strong and long at 33/39, 1 medium long dorsally directed and rather anteral one at 30/39; posterodorsals: strong at 8/39, very strong at 28/39, very long and thick at 32/39; no mid ventral but a row of thick and short setae along distal 3/4 of tibia; apicoventral thick but only 0.05 mm long. Wings definitely brown, veins dark brown. R_1 very thick and short, R_{2+3} strongly S-shaped (sinuate), runs close to *C* from its basal quarter, R_{4+5} upcurving to *C* along a wide arc. M_{1+2} distinct on a section of 0.38 mm only, i.e. diminishes halfway from t_p to wing margin. M_{3+4} distinct on a section of 0.095 mm only, duscal cell very broad. t_a-t_p only slightly longer (0.190 mm) than t_p (0.155 mm). Halteres rather small, knob ochreous, stalk waxy yellow.

Preabdomen comparatively long and flat without any conspicuous setae. Sternite 5 posteromedially with blunt and somewhat flattened short setae (Fig. 25).



Figs 24-30

Terminalia of *Biroina topali* sp. n., holotype male; 24. sternite 5 with a part of sternite 6, 25. posteroventral part of sternite 5 in a higher magnification, 26. ventral part of epandrium with left subanal process in its widest, 27. surstylus in its widest extension, 28. aedeagal complex laterally, 29. hypandrium in ventral view, 30. male genitalia laterally. Scale bars: 0.1 mm (Fig. 26), 0.2 mm (Figs 24, 25, 27-29, 30).

Genitalia: epandrium (periandrium) not high (only a little higher than long), ventrocaudal part of epandrium with a pair of subanal processes (Fig. 26), which bear 1 long and several shorter setae. Lateroventral process of epandrium (Fig. 26) with broad base. Ventral surface of slipper-shaped ventral process of hypandrium with small teeth, serrate backwards (Fig. 29), hypandrial apodeme stronger than in *orientalis*. Lateral lobe of surstylus (gonostylus) with very long bristles also in its apical third, medial lobe of surstylus (Fig. 27) lobate, with setae longer than in *burckhardti*. Aedeagal complex with long digitiform phallopore. Postgonite (Fig. 28) curved in distal third (somewhat more curved than in *orientalis*), its basal part much longer than its apical part. Ejaculatory apodeme rather long but thin.

Female unknown.

Biroina topali sp. n. is closely related to *B. orientalis* but the holotype is bigger than any of the *orientalis* specimens measured, it possesses 5 pairs of *ifr* bristles (instead of 4) and it differs in some details of the male genitalia.

Etymology. The species is dedicated to Dr. György Topál (HNHM) in recognition of the invaluable materials collected by him in Argentina, India, Vietnam, etc.

KEY TO THE ORIENTAL SPECIES OF *Biroina*

- 1 Wings tessellate with darker diffuse dark spots on lighter basic colour. Male cerci well-sclerotized with long setae (Fig. 12) Male phallopore (Fig. 11) very long, proclinate and very thin apically. Postgonite (Fig. 11) rather broad in its basal half. Female spermathecae pearshaped with long sclerotized duct (Fig. 13). [*myrmecophila* (Knab & Malloch)]
- Wings light brown, veins darker brown. Male cerci weakly sclerotized with short hairs only. Male phallopore shorter, digitiform (e.g. Fig. 23). Postgonites (Figs 3, 23, 28) less broad. Female spermathecae spherical with short duct (Fig. 17; females of *burckhardti* and *topali* unknown). 2
- 2 Sternite 5 posteromedially with acute short setae (Fig. 2). Medial lobe of surstylus (Figs 4, 5) long, digitiform with minute setae only. Postgonite (Fig. 6) geniculate, its basal part much shorter than its apical part. *burckhardti* sp. n.
- Male sternite 5 posteromedially with blunt and somewhat flattened short setae (Figs 19, 25). Medial lobe of surstylus (Figs 21, 27) lobate, with longer setae. Postgonite (Figs 23, 28) curved in distal third, its basal part much longer than its apical part. 3
- 3 Four pairs of *ifr* bristles. Lateral lobe of surstylus with numerous very long setae on its lateral surface but no long bristles in its apical (cranial) 2/5 (Fig. 21). Ventral surface of slipper-shaped ventral process of hypandrium without small teeth (Fig. 20). Smaller (body length 1.67–2.58 mm). *orientalis* sp. n.

- Five pairs of *ifr* bristles. Lateral lobe of surstylus (gonostylus) with very long bristles also in its apical third (Fig. 27). Ventral surface of slipper-shaped ventral process of hypandrium serrate, i.e. with small teeth (Fig. 29). Bigger (body length 2.96 mm) *topali* sp. n.

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REFERENCES

- DUDA, O. 1925. Die aussereuropäischen Arten der Gattung *Leptocera* Olivier = *Limosina* Macquart (Dipteren) mit Berücksichtigung der europäischen Arten. *Arch. Naturgesch.* A 90(11): 5–215.
- KNAB, F. & J.R. MALLOCH. 1912. New Australian Diptera from ants' nests. *Trans. R. Soc. South Austr.* 36: 233–237.
- MARSHALL, S.A. 1989. 96. Family Sphaeroceridae. In: Evenhuis, N.L. (ed.): Catalog of the Diptera of the Australasian and Oceanian Regions/ Bishop Museum Press and E.J. Brill, Honolulu, 1155 pp. (pp. 601–607).
- PAPP, L. 1979. On apterous and reduced-winged forms of the families Drosophilidae, Ephydriidae and Sphaeroceridae (Diptera). *Acta zool. hung.* 25(3–4): 357–374.
- PAPP, L. 1991. Oriental Limosininae: new species and records (Diptera, Sphaeroceridae). *Acta zool. hung.* 37(3–4): 225–251.
- RICHARDS, O.W. 1973. The Sphaeroceridae (= Borboridae or Cypselidae); Diptera Cyclorrhapha) of the Australian Region. *Austr. J. Zool.*, Suppl. Ser. 22: 297–401.
- ROHÁČEK, J. 1982. A monograph and re-classification of the previous genus *Limosina* Macquart (Diptera, Sphaeroceridae) of Europe. Part I. *Beitr. Ent.* 32: 195–282.
- ROHÁČEK, J. 1983. ditto, Part II and III. *Beitr. Ent.* 33: 3–195, 203–255.
- ROHÁČEK, J. & L. PAPP. 1988. A review of the genus *Paralimosina* L. Papp (Diptera, Sphaeroceridae), with descriptions of ten new species. *Annl. hist. nat. Mus. natn. hung.* 80: 105–143.